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WATER SUPPLY OUTLOOK FOR WESTERN UNITED STATES

Including Columbia River Drainage in Canada

Prepared by

U. S. DEPARTMENT of AGRICULTURE ★ SOIL CONSERVATION SERVICE

Collaborating with

**CALIFORNIA DEPARTMENT of WATER RESOURCES
and**

**BRITISH COLUMBIA DEPARTMENT of
LANDS, FORESTS and WATER RESOURCES**

AS OF
MAR. 1, 1973

TO RECIPIENTS OF WATER SUPPLY OUTLOOK REPORTS:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season will interact with a resultant average effect on runoff. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1900 snow courses in Western United States and in the Columbia Basin in British Columbia. Networks of automatic snow water equivalent and related data sensing devices, along with radio telemetry are expanding and will provide a continuous record of snow water and other parameters at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

PUBLISHED BY SOIL CONSERVATION SERVICE

The Soil Conservation Service publishes reports following the principal snow survey dates from January 1 through June 1 in cooperation with state water administrators, agricultural experiment stations and others. Copies of the reports for Western United States and all state reports may be obtained from Soil Conservation Service, Western Regional Technical Service Center, Room 209, 511 N. W. Broadway, Portland, Oregon 97209.

Copies of state and local reports may also be obtained from state offices of the Soil Conservation Service in the following states:

STATE	ADDRESS
Alaska	204 E. 5th. Ave., Room 217, Anchorage, Alaska 99501
Arizona	6029 Federal Building, Phoenix, Arizona 85025
Colorado (N. Mex.)	P. O. Box 17107, Denver, Colorado 80217
Idaho	Room 345, 304 N. 8th. St., Boise, Idaho 83702
Montana	P. O. Box 970, Bozeman, Montana 59715
Nevada	P. O. Box 4850, Reno Nevada 89505
Oregon	1218 S. W. Washington St., Portland, Oregon 97205
Utah	4012 Federal Bldg., 125 South State St., Salt Lake City, Utah 84111
Washington	360 U.S. Court House, Spokane, Washington 99201
Wyoming	P. O. Box 2440, Casper, Wyoming 82601

PUBLISHED BY OTHER AGENCIES

Water Supply Outlook reports prepared by other agencies include a report for California by the Water Supply Forecast and Snow Surveys Unit, California Department of Water Resources, P. O. Box 388, Sacramento, California 95802 --- and for British Columbia by the Department of Lands, Forests and Water Resources, Water Resources Service, Parliament Building, Victoria, British Columbia



WATER SUPPLY OUTLOOK FOR WESTERN UNITED STATES

Including Columbia River Drainage in Canada

ISSUED

MARCH 1, 1973

The Soil Conservation Service coordinates snow surveys conducted by its staff and many cooperators, including the Bureau of Reclamation, Corps of Engineers, Forest Service, National Park Service, NOAA, National Weather Service, Geological Survey, and other Federal Agencies, Departments of State Government, Irrigation Districts, Power Companies, and others.

The Department of Water Resources coordinates snow surveys in California.

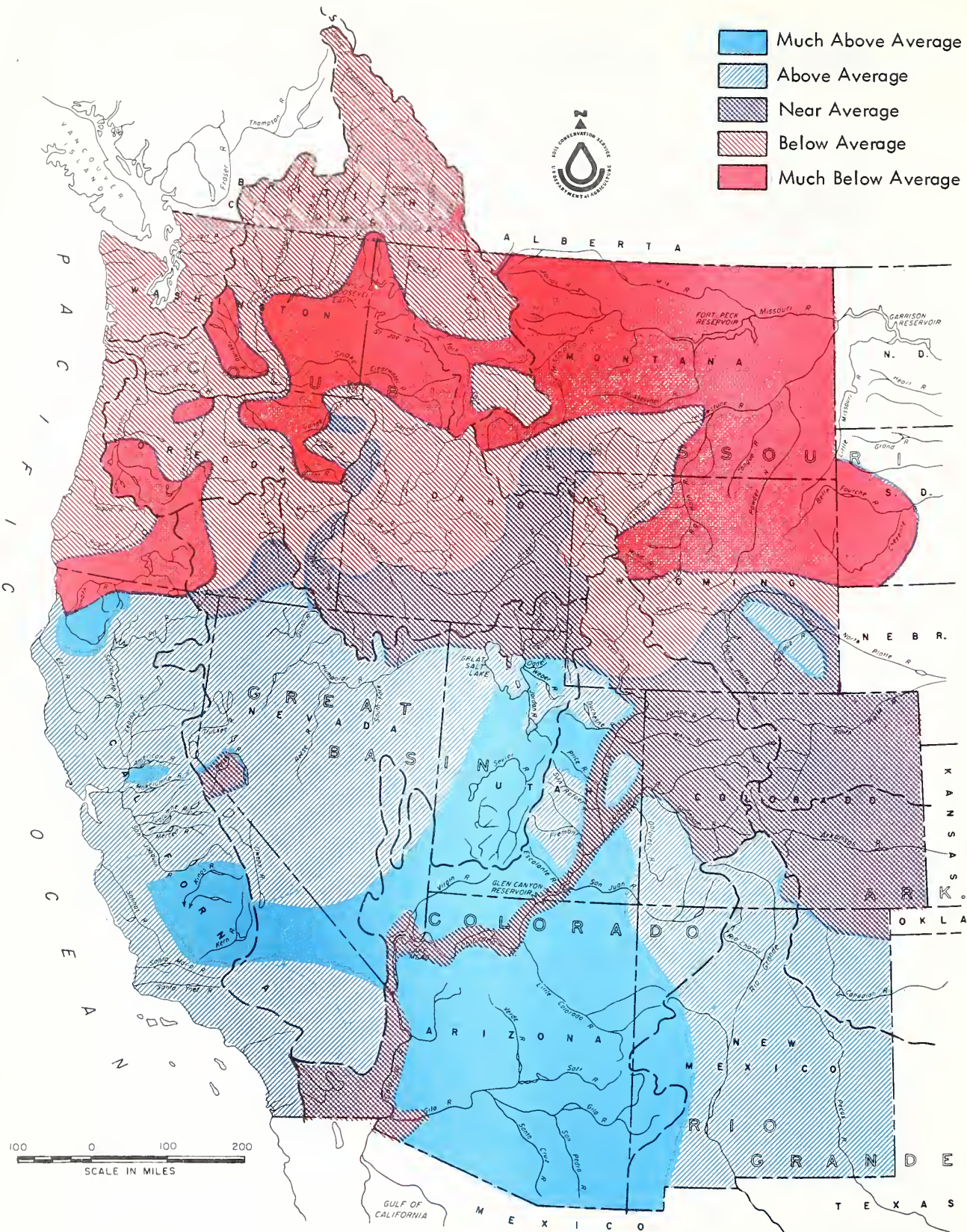
The Water Resources Service, Department of Lands, Forests, and Water Resources directs snow surveys in British Columbia.

This report was prepared by the Water Supply Forecasting Unit, Engineering Division, Soil Conservation Service, from data supplied by Snow Survey Supervisors of the Soil Conservation Service in the States of Alaska, Arizona, Colorado and New Mexico, Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming.

Data from California was supplied by the Chief, Water Supply Forecast and Snow Survey Unit, Department of Water Resources.

Data from British Columbia was supplied by the Chief, Hydrology Division, Water Investigations Branch, Department of Lands, Forests and Water Resources.

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
KENNETH E. GRANT, ADMINISTRATOR



1973 SNOWMELT SEASON
 PROSPECTIVE STREAMFLOW
 AS OF MARCH 1, 1973

WATER SUPPLY OUTLOOK

1973 SNOWMELT SEASON
MARCH 1, 1973

WATER SUPPLY FOR IRRIGATION PURPOSES WILL BE REASONABLY SATISFACTORY TO EXCELLENT FOR MOST MAJOR IRRIGATED AREAS OF THE WEST. SHORTAGES ARE IN PROSPECT FOR SOME PARTS OF OREGON, WASHINGTON, IDAHO, MONTANA AND WYOMING. OVER TWICE NORMAL STREAMFLOW EXPECTED FROM SOME UTAH AND ARIZONA WATERSHEDS.

Present western snowpacks are highly variable, indicating extreme runoff conditions for next summer. The pattern of recent years has been reversed, with the most favorable outlook in prospect for southern areas. Unless spring months are very wet, irrigation shortages are highly probable for many smaller areas of Oregon, Washington, Idaho, Montana and Wyoming.

Fortunately, reservoir storage is generally average or higher in nearly all areas of the west. This will, to a large degree, offset the low streamflow expected from many streams in the northern areas. However, farmers, ranchers and other water users who are served by direct diversion from streams may experience critical shortages during mid and late summer months.

Snow accumulation during February continued to fall behind normal in nearly all sections of the Columbia and Missouri basins. This intensified the adverse effects of an already low snow cover. In the Columbia Basin the snowpack now ranges between about one-half to three-fourths of usual amounts on most major water producing areas. The British Columbia Water Resources Service, Department of Lands, Forests and Water Resources reports that the snow is 83 percent on the upper Columbia, but drops to about 60 to 80 percent on the lower Columbia, Kootenay, Kettle, Okanagan and Similkameen rivers.

Snow is only 40 to 60 percent normal on Idaho's Spokane River and most watersheds of the Cascade Mountains. At 15 percent, snow has practically disappeared from the Palouse River.

In the Missouri Basin snow cover is similar to that of the Columbia Basin. It is slightly over one-half average along the Continental Divide from the Canadian border south to the Dearborn River. It is only slightly better on the Missouri main stem, and the Judith and Musselshell rivers. The snowpack is near average to 25 percent less than average on watersheds which head near Yellowstone Park. To the east of here it falls off sharply to near 60 percent in the Big Horn Mountains and

is only slightly over a third average in the Black Hills.

Near normal runoff is expected from the North and South Platte and the Arkansas rivers.

The California Department of Water Resources reports excellent water supply prospects for almost all areas of the State. Reservoir storage is near average. Central Valley streams are expected to yield 15 to 65 percent above average amounts from snowmelt runoff, with southern streams expected to produce most heavily.

In the upper Colorado River Basin snow cover averages near 5 percent above normal, but ranges from a low of 77 percent on the upper Green River in Wyoming to a high of 140 percent on the Dolores River in southwest Colorado. With inflow to Lake Powell for the April-July period forecast at 110 percent, prospects for water and power interests in the Lower Basin continue good.

In the Lower Colorado River Basin, Utah's Virgin River and adjacent smaller streams, as well as all of Arizona's watersheds are expected to flow at amounts from near 170 to over 200 percent of average. Reservoir storage is also far above average, adding further assurance of an excellent water supply.

Reservoir storage in the Great Basin is excellent. Combined with near normal to over twice normal streamflow prospects in all areas except Lake and Harney counties in Oregon, a very good water season is in prospect. Some shortages may be experienced in the Oregon section of the Basin.

MISSOURI BASIN

February snowfall on the upper Missouri River and its tributaries in Montana was very light, accentuating an already poor snowpack. The greatest snowpack deficiencies, at slightly over one-half average, lie on the Milk, Marias, Teton, Sun and Dearborn river drainages. It

SUMMARY OF SNOW WATER EQUIVALENT MEASUREMENTS

MARCH 1, 1973

MAJOR BASIN AND SUB - WATERSHED	WATER EQUIVALENT IN PERCENT OF:		MAJOR BASIN AND SUB - WATERSHED	WATER EQUIVALENT IN PERCENT OF:	
	LAST YEAR	AVERAGE		LAST YEAR	AVERAGE
MISSOURI BASIN			SNAKE BASIN		
Jefferson	47	78	Snake above Jackson, Wyo.	54	78
Madison	59	81	Snake above Hiese, Idaho	53	77
Gallatin	65	75	Snake abv. American Falls Res.	55	80
Missouri Main Stem	37	64	Henry's Fork	62	87
Yellowstone	55	78	Southern Idaho Tributaries	56	104
Shoshone	50	83	Big and Little Wood	67	78
Wind	48	79	Boise	47	78
North Platte	86	100	Owyhee	60	105
South Platte	86	92	Payette	57	81
ARKANSAS BASIN			Malheur	65	85
Arkansas	89	92	Weiser	53	91
Cucharas-Purgatoire	100	100	Burnt	45	70
RIO GRANDE BASIN			Powder	45	70
Rio Grande (Colo.)	127	128	Salmon	51	73
Rio Grande	190	137	Grande Ronde	50	70
Pecos	410	180	Clearwater	38	60
COLORADO BASIN			LOWER COLUMBIA BASIN		
Green (Wyo.)	51	77	Yakima	23	51
Yampa - White	91	92	Umatilla	25	45
Duchesne	79	109	John Day	45	70
Price	104	122	Deschutes - Crooked	38	65
Upper Colorado	91	99	Hood	25	45
Gunnison	113	113	Willamette	25	40
San Juan	139	128	Lewis	23	45
Dolores	144	140	Cowlitz	26	47
Virgin	166	178	PACIFIC COASTAL BASIN		
Gila	514	189	Puget Sound	30	51
Salt	603	207	Olympic Peninsula	44	66
GREAT BASIN			Umpqua - Rogue	40	65
Bear	66	95	Klamath	45	60
Logan	59	81	Trinity	140	140
Ogden	88	139	CALIFORNIA		
Weber	78	108	CENTRAL VALLEY		
Provo - Utah Lake	111	125	Upper Sacramento	100	115
Jordan	89	119	Feather	135	145
Sevier	143	155	Yuba	115	130
Walker - Carson	160	123	American	110	125
Tahoe - Truckee	114	126	Mokelumne	115	125
Humboldt	91	129	Stanislaus	125	125
Lake Co. (Oregon)	45	75	Tuolumne	130	125
Harney Basin (Oregon)	65	95	Merced	140	140
UPPER COLUMBIA BASIN			San Joaquin	160	130
Columbia (Canada)	60	80	Kings	200	160
Kootenai	47	74	Kaweah	245	165
Clark Fork	40	65	Tule	320	175
Bitterroot	43	72	Kern	270	155
Flathead	47	73	Owens	215	140
Spokane	35	54	Data for California Watersheds supplied by Dept. of Water Resources, and for British Columbia Watersheds by Dept. of Lands, Forests and Water Resources.		
Okanogan	46	68			
Methow	46	74	Average is for 1953-67 period. California averages are for the period 1931-70. Based on Selected Snow Courses determined by Dis- tribution within the Basin, Length of Record and Repetitive Monthly Measurement Schedules.		
Chelan	51	81			
Wenatchee	29	54			

is only slightly better on the Missouri main stem, the Judith and Musselshell rivers. Most favored areas are on the Red Rock, Ruby and Madison rivers where snow ranges from near average to 20 percent below average.

Moving south into Wyoming the snowpack remains near 75 to 85 percent of average on the upper Yellowstone, Shoshone and Wind rivers. It falls to near 60 percent average in the Big Horn Mountains and is only slightly over a third of average in the Black Hills.

Snow cover on the North Platte River is average, but slightly below on the South Platte.

Anticipated flow of streams in Montana ranges from near one-half to two-thirds average in the light snowpack areas, to within 10 percent of average on the Madison and upper Yellowstone. Flow of Wyoming's Shoshone and Wind rivers and their tributaries is expected to be near 60 to 80 percent average, while streams heading in the Big Horn Mountains should yield near 50 to 60 percent average. Unless March and April storms are considerably above normal, farmers and ranchers in this area and on streams draining from the Black Hills, who are on direct stream diversions without adequate reservoir rights, will face serious late season shortages.

The North Platte and its tributaries should yield from average to about 10 percent above average amounts, while the South Platte and its tributaries should supply average to near 10 percent less than usual.

Carryover reservoir storage is 114 percent average in Montana, 81 percent average on Wyoming's Wind River, 177 percent on the North Platte, 127 percent on Colorado's South Platte, and 190 percent in Belle Fourche Reservoir.

ARKANSAS BASIN

The main Arkansas River snowpack is a little below normal for this time of year, while on its southern tributaries it is essentially normal. If snowfall and spring rains during the remainder of the season are near average, flow of the Arkansas at Salida should be within a few percent of the usual amount. Outlook for the Cucharas and Purgatoire rivers is for flow to be within 10 percent normal. Flow of the Canadian River in New Mexico should be more than 10 percent above average.

Storage in John Martin Reservoir is 20 percent average. In New Mexico on the Canadian River, storage in Conchas Reservoir is almost double that of last year, but is still 12 percent less than normal.

Soil moisture continues good in both mountain and valley areas.

RIO GRANDE BASIN

The snowpack continues above average on all watersheds of the Rio Grande Basin. It ranges from 128 percent in Colorado to 137 percent on the New Mexico tributaries. On the Pecos River the snow is 180 percent average.

Mountain and valley soil moisture conditions are still reported to be good.

Flow of the Rio Grande near Del Norte, Colorado is expected to be 14 percent more than usual. Inflow to the river system should be near 22 percent above normal from the Chama River and essentially the same - 24 percent above - from the Conejos River. The water supply of the Pecos River is expected to be comparable, being forecast at 127 percent.

Carryover storage in Elephant Butte is a few percent above average, while storage in El Vado is nearly six times the usual amount.

COLORADO BASIN

Although February snowfall on the watersheds of the Colorado Basin was considerably less than usual, the snowpack still remains a little above average. However, it varies from a low of 77 percent on the upper Green River in Wyoming to a high of 140 percent on the Dolores River in southwest Colorado. The snow is average to 10 percent below average on the Yampa, White and upper Colorado rivers. It is near 10 to 30 percent above normal on the Duchesne, Price, Gunnison and San Juan rivers.

Soil moisture conditions continue good and will require a minimum of priming from snow-melt water before runoff begins. Unless the dry weather pattern of February persists through the spring months, water supplies will be generally adequate in Wyoming, fair in northern Colorado and excellent elsewhere in the upper basin. Prospective runoff is lowest in Wyoming where prospective streamflow is anticipated at 15 to 20 percent less than average. Flow of the Little Snake, Yampa and White rivers is currently forecast to be within 5 to 10 percent less than usual amounts.

Inflow to Flaming Gorge Reservoir is indicated to be a little below average. After contributions from the Yampa, White and Duchesne rivers, flow of the Green River at Green River, Utah is expected to be 3 percent less than average. Flow of the Colorado near Cisco, Utah is forecast at 114 percent, while the San Juan near Bluff, Utah is forecast at 133 percent. Present prospects for the April-July inflow to Lake Powell are for 110 percent. Other streams where flows are still expected to range from about a fourth to a half more than usual include the Dolores, Strawberry, Duchesne, Price and Animas rivers. Storage in

SELECTED STREAMFLOW FORECASTS

MARCH 1, 1973

STREAM AND STATION	FORECASTS THIS YEAR		Forecast Period	Last Year's Flow In (1,000 A.F.)
	Flow In (1,000 A.F.)	Percent of Average		
SASKATCHEWAN				
St. Mary near Babb, Montana <u>1/</u>	420	85	April-Sept.	
UPPER MISSOURI				
Beaverhead near Grant, Montana <u>2/</u>	72	68	April-Sept.	207
Big Hole near Melrose, Montana	400	62	April-Sept.	
Jefferson at Silver Star, Montana	520	60	April-Sept.	
Madison near Grayling, Montana <u>3/</u>	415	97	April-Sept.	626
Gallatin near Gateway, Montana	395	86	April-Sept.	
Sun at Gibson Dam, Montana <u>4/</u>	385	64	April-Sept.	749
Belt near Monarch, Montana	72	66	April-Sept.	
Marias near Shelby, Montana <u>5/</u>	300	50	April-Sept.	
Missouri near Landusky, Montana <u>6/</u>	2,600	58	April-Sept.	
near Williston, North Dakota <u>7/</u>	6,300	57	April-Sept.	
S. Fk. Musselshell above Martinsdale, Montana	20	45	April-Sept.	
Milk at Eastern Crossing, Montana	200	71	March-Sept.	
Yellowstone at Yellowstone Lake Outlet, Wyo.	677	81	April-Oct.	1,111
at Corwin Springs, Montana	1,750	93	April-Sept.	2,349
at Miles City, Montana <u>8/</u>	4,100	70	April-Sept.	
Clarks Fork near Belfry, Montana	445	76	April-Sept.	
Shoshone below Buffalo Bill Res., Wyo. <u>9/</u>	576	71	April-Sept.	894
Wind near Dubois, Wyoming	60	61	April-Sept.	150
at Riverton, Wyoming <u>10/</u>	420	65	April-Sept.	879
below Boysen Res., Wyoming <u>11/</u>	550	73	April-Sept.	
Bull Lake Creek near Lenore, Wyoming	145	81	April-Sept.	214
Little Popo Agie near Lander, Wyoming	34	80	April-Sept.	61
Tensleep near Tensleep, Wyoming	44	59	April-Sept.	92
Medicine Lodge near Hyattville, Wyoming	11	56	April-Sept.	22.4
Shell Creek near Shell, Wyoming	37	56	April-Sept.	81
Big Horn near St. Xavier <u>8/</u>	1,050	61	April-Sept.	2,153
Tongue near Dayton, Wyoming	71	69	April-Sept.	109
No. Fork Powder near Hazelton, Wyoming	5	54	April-Sept.	7.7
PLATTE				
North Platte at Saratoga, Wyoming	555	100	April-Sept.	
Encampment near Encampment, Wyoming	136	107	April-Sept.	131
Laramie & Pioneer Canal, nr Woods, Wyo. <u>12/</u>	118	100	April-Sept.	114
Big Thompson at Drake, Colorado <u>13/</u>	95	95	April-Sept.	
Clear at Golden, Colorado <u>14/</u>	115	97	April-Sept.	
St. Vrain at Lyons, Colorado <u>15/</u>	65	93	April-Sept.	
Cache La Poudre near Fort Collins, Colorado <u>16/</u>	210	97	April-Sept.	
ARKANSAS				
Arkansas at Salida, Colorado <u>17/</u>	300	97	April-Sept.	
Cucharas near LaVeta, Colorado	11	92	April-Sept.	
Purgatoire at Trinidad, Colorado	40	90	April-Sept.	
RIO GRANDE				
Rio Grande near Del Norte, Colorado <u>18/</u>	500	114	April-Sept.	
at Otowi Bridge, New Mexico <u>19/</u>	600	117	March-July	
Conejos near Mogote, Colorado <u>20/</u>	225	124	April-Sept.	
El Vado Res., Inflow, New Mexico	230	122	March-July	
Pecos at Pecos, New Mexico	52	127	March-July	
UPPER COLORADO				
Colorado, Grandby Res. Inflow, Colorado <u>21/</u>	205	94	April-Sept.	
near Dotsero, Colorado <u>22/</u>	1,350	98	April-Sept.	
near Cameo, Colorado <u>23/</u>	2,100	95	April-Sept.	
near Cisco, Utah <u>24/</u>	3,196	114	April-July	1,594
Lake Powell Inflow, Arizona <u>25/</u>	7,180	110	April-July	5,578
Roaring Fork at Glenwood Springs, Colorado <u>26/</u>	700	101	April-Sept.	
Uncompahgre at Colona, Colorado	155	120	April-Sept.	

Forecasts in California provided by Department of Water Resources.
Average is for 1953-67 period except California. California is computed for 1921-70 period.
Forecasts assume average Effective Climate Conditions from Date Through Snow Melt Season.

Explanatory Notes on Forecasts listed on Inside Back Cover.

SELECTED STREAMFLOW FORECASTS

MARCH 1, 1973

STREAM AND STATION	FORECASTS THIS YEAR		Forecast Period	Last Year's Flow In (1,000 A.F.)
	Flow In (1,000 A.F.)	Percent of Average		
UPPER COLORADO (continued)				
Gunnison, Blue Mesa Res. Inflow, Colorado <u>27/</u>	780	102	April-Sept.	
near Grand Junction, Colorado <u>28/</u>	1,350	119	April-Sept.	
Dolores at Dolores, Colorado	290	126	April-Sept.	
Green at Warren Bridge, Wyoming	270	84	April-Sept.	431
at Green River, Wyoming <u>29/</u>	780	83	April-Sept.	1,645
Flaming Gorge Res. Inflow, Utah <u>27/</u>	1,035	98	April-July	1,967
at Green River, Utah <u>30/</u>	2,488	97	April-July	2,030
North Piney at Mason, Wyoming	28	81	April-Sept.	51
Big Sandy near Big Sandy, Wyoming	44	83	April-Sept.	82
Yampa at Steamboat Springs, Colorado	250	96	April-Sept.	
near Maybell, Colorado	780	91	April-Sept.	
Little Snake near Dixon, Wyoming	233	90	April-Sept.	
White near Meeker, Colorado	270	92	April-Sept.	
Strawberry at Duchesne, Utah <u>40/</u>	75	153	April-July	
Duchesne near Tabiona, Utah <u>31/</u>	115	122	April-July	
at Randlett, Utah <u>40/</u>	340	130	April-July	
Lakefork below Moon Lake, Utah <u>32/</u>	70	106	April-July	
Uinta near Neola, Utah	90	113	April-July	
Whiterocks near Whiterocks, Utah	55	108	April-July	46
Price, Scofield Res. Inflow, Utah <u>33/</u>	43	136	April-July	19
Cottonwood near Orangeville, Utah <u>34/</u>	50	114	April-July	33
San Juan, Navajo Res. Inflow, New Mexico <u>27/</u>	800	129	April-July	259
near Bluff, Utah <u>35/</u>	1,185	133	April-July	276
Animas at Durango, Colorado	525	128	April-Sept.	
LOWER COLORADO				
Virgin near Virgin, Utah	70	184	April-June	
Little Colorado above Lyman, Arizona	15	192	March-June	2.0
Gila near Solomon, Arizona	148	203	March-May	15.2
Frisco at Clifton, Arizona	75	194	March-May	9.0
Salt at Intake, Arizona	360	178	March-May	55.4
Tonto above Roosevelt, Arizona	33	147	March-May	1.5
Verde above Horseshoe Dam, Arizona	165	155	March-May	31
GREAT BASIN				
Bear at Utah-Wyo. State Line	115	108	April-July	
at Harer, Idaho	255	113	April-Sept.	
Smith's Fork near Border, Wyoming	99	92	April-Sept.	175
Thomas Fork near Wyo.-Ida. State Line	28	89	April-Sept.	59
Logan near Logan, Utah <u>36/</u>	110	111	April-July	
Ogden, Pine View Res. Inflow, Utah <u>27/</u>	135	150	April-June	136
Weber near Oakley, Utah	105	113	April-June	115
Provo near Hailstone, Utah <u>37/</u>	108	125	April-July	
Strawberry Res. Inflow, Utah	52	127	April-July	38
Utah Lake Net Inflow, Utah	241	123	April-July	204
Big Cottonwood near Salt Lake City, Utah	36	105	April-July	40
Beaver near Beaver, Utah	26	138	April-July	6.4
Sevier near Hatch, Utah	54	165	April-July	
near Gunnison, Utah	51	165	April-July	
So. Fork Humboldt near Elko, Nevada	70	120	April-July	41
Humboldt at Palisades, Nevada	197	128	April-July	139
Truckee at Farad, California <u>38/</u>	289	112	April-July	164
East Carson near Gardnerville, Nevada	197	112	April-July	134
West Carson at Woodsfords, California	59	116	April-July	39
East Walker near Bridgeport, California <u>39/</u>	64	107	April-August	31
West Walker near Coleville, California	150	105	April-July	108
Donner und Blitzen near Frenchglen, Oregon	55	96	March-July	
Silvies near Burns, Oregon	70	70	March-July	
Chewaucan near Paisley, Oregon	59	66	March-July	117
Deep above Adel, Oregon	68	93	March-July	
Bidwell near Ft. Bidwell, California	11.5	100	April-July	
Owens below Long Valley Res., California	75	120	April-July	40

Forecasts in California provided by Department of Water Resources.
Average is for 1953-67 period except California. California is computed for 1921-70 period.
Forecasts assume average Effective Climate Conditions from Date Through Snow Melt Season.

Explanatory Notes on Forecasts listed on Inside Back Cover.

SELECTED STREAMFLOW FORECASTS

MARCH 1, 1973

STREAM AND STATION	FORECASTS THIS YEAR		Forecast Period	Last Year's Flow In (1,000 A.F.)
	Flow In (1,000 A.F.)	Percent of Average		
UPPER COLUMBIA				
Columbia at Birchbank, British Columbia <u>40/</u>	39,560	85	April-Sept.	52,590
at Grand Coulee, Washington <u>40/</u>	55,570	80	April-Sept.	83,880
below Rock Island, Washington	59,500	78	April-Sept.	98,040
Kootenai at Libby, Montana	6,900	86	April-Sept.	9,929
at Leonia, Idaho	7,750	84	April-Sept.	11,041
Blackfoot near Bonner, Montana	690	68	April-Sept.	1,429
So. Fk. Flathead nr Columbia Falls, Montana <u>40/</u>	1,880	80	April-Sept.	2,850
Flathead at Columbia Falls, Montana <u>40/</u>	5,000	77	April-Sept.	7,821
near Polson, Montana <u>40/</u>	5,800	75	April-Sept.	9,182
Clark Fork above Missoula, Montana	1,280	73	April-Sept.	2,430
near Plains, Montana <u>40/</u>	9,100	73	April-Sept.	16,073
at Whitehorse Rapids, Idaho	10,100	72	April-Sept.	
Bitterroot near Darby, Montana	370	66	April-Sept.	726
Priest near Priest River, Idaho <u>41/</u>	550	60	April-July	
Pend Oreille below Box Canyon, Washington	11,220	70	April-Sept.	
Kettle near Laurier, Washington	1,495	78	April-Sept.	
Spokane at Post Falls, Idaho <u>42/</u>	1,750	56	April-Sept.	
Similkameen near Nighthawk, Washington	1,110	73	April-Sept.	3,162
Okanogan near Tonasket, Washington	1,270	73	April-Sept.	3,824
Methow near Pateros, Washington	825	78	April-Sept.	
Stehekin at Stehekin, Washington	690	76	April-Sept.	
Chelan at Chelan, Washington <u>43/</u>	950	75	April-Sept.	1,965
Wenatchee at Peshastin, Washington	1,350	74	April-Sept.	2,808
SNAKE				
Snake above Palisades Res., Wyoming <u>44/</u>	2,120	83	April-Sept.	3,504
near Heise, Idaho <u>45/</u>	3,250	87	April-Sept.	5,309
near Blackfoot, Idaho <u>46/</u>	3,400	88	April-July	6,140
at Weiser, Idaho	4,450	70	April-Sept.	
Grey's above Palisade, Wyoming	370	102	April-Sept.	556
Salt above Palisade, Wyoming	340	106	April-Sept.	575
Henry's Fork near Ashton, Idaho <u>47/</u>	550	90	April-Sept.	820
Teton near St. Anthony, Idaho	365	93	April-Sept.	568
Blackfoot Reservoir Inflow, Idaho	100	98	April-Sept.	
Big Lost near MacKay, Idaho <u>48/</u>	145	86	April-Sept.	
Portneuf at Topaz, Idaho	75	94	March-Sept.	
Salmon Falls Creek nr San Jacinto, Idaho	70	100	March-Sept.	
Big Wood, Inflow to Magic Res., Idaho <u>49/</u>	190	73	April-Sept.	
Bruneau near Hot Springs, Idaho	190	100	March-Sept.	
Boise near Boise, Idaho <u>50/</u>	1,250	80	April-Sept.	
Jordan near Jordan Valley, Oregon	67	79	April-July	
Owyhee near Owyhee, Nevada <u>51/</u>	60	100	April-July	86
Owyhee Res. Net Inflow, Oregon <u>27/</u>	323	88	March-July	905
Malheur near Drewsey, Oregon	65	72	March-July	
Payette near Horseshoe Bend, Idaho <u>52/</u>	1,550	84	April-Sept.	
Weiser above Crane Creek, Idaho <u>40/</u>	480	95	March-Sept.	
Burnt near Hereford, Oregon <u>40/</u>	28	65	March-July	
Powder near Sumpter, Oregon	34	63	April-July	
Eagle above Skull Creek, Oregon	167	99	April-July	
Imnaha at Imnaha, Oregon	272	88	April-Sept.	
Salmon at Whitebird, Idaho	5,400	79	April-Sept.	
Lostine near Lostine, Oregon	103	88	April-Sept.	
Grande Ronde at LaGrande, Oregon	109	52	March-July	345
Clearwater at Spalding, Idaho	5,500	64	April-Sept.	
LOWER COLUMBIA				
Yakima at CleElum, Washington <u>53/</u>	674	70	April-Sept.	
near Parker, Washington <u>54/</u>	1,010	58	April-Sept.	
Naches near Naches, Washington <u>55/</u>	585	65	April-Sept.	

Forecasts in California provided by Department of Water Resources.
Average is for 1953-67 period except California. California is computed for 1921-70 period.
Forecasts assume average Effective Climate Conditions from Date Through Snow Melt Season.

Explanatory Notes on Forecasts listed on Inside Back Cover.

SELECTED STREAMFLOW FORECASTS

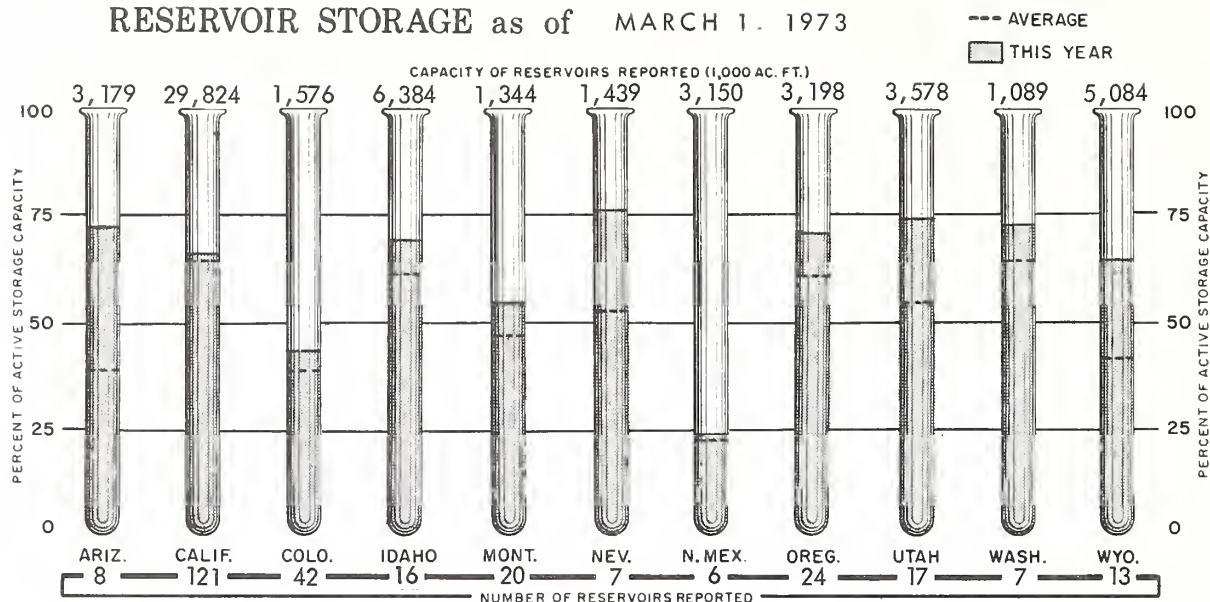
MARCH 1, 1973

STREAM AND STATION	FORECASTS THIS YEAR		Forecast Period	Last Year's Flow In (1,000 A.F.)
	Flow In (1,000 A.F.)	Percent of Average		
LOWER COLUMBIA (continued)				
Walla Walla, So. Fk. near Milton, Oregon	63	80	March-Sept.	134,620
Umatilla at Pendleton, Oregon	135	65	March-Sept.	
John Day, Middle Fork at Ritter, Oregon	96	71	March-July	
North Fork at Monument, Oregon	468	69	March-July	
Crooked near Post, Oregon	101	72	March-July	
Deschutes at Benham Falls, Oregon <u>40/</u>	339	86	April-July	
Columbia at The Dalles, Oregon <u>40/</u>	78,500	75	April-Sept.	
Hood near Tucker Bridge, Oregon <u>40/</u>	197	70	April-July	
McKenzie near Vida, Oregon	815	75	April-July	
Santiam, South, at Waterloo, Oregon	375	63	April-July	
North, at Mehama, Oregon <u>40/</u>	504	63	April-July	
Clackamas at Estacada, Oregon	480	70	April-July	
Willamette at Salem, Oregon <u>40/</u>	2,999	64	April-July	
Lewis at Ariel, Washington <u>56/</u>	1,020	75	April-Sept.	
Cowlitz at Castle Rock, Washington <u>57/</u>	2,030	72	April-Sept.	
NORTH PACIFIC COASTAL				
Dungeness near Sequim, Washington	125	73	April-Sept.	479
Umpqua, No., near Toketee Falls, Oregon <u>40/</u>	135	77	April-Sept.	
Rogue at Raygold, Oregon	719	76	April-Sept.	
Klamath Lake, Net Inflow, Oregon	422	68	April-Sept.	
Trinity at Lewiston, California	820	133	April-July	
CALIFORNIA CENTRAL VALLEY <u>40/</u>				
Sacramento, Inflow to Shasta, California	2,040	115	April-July	1,621
Feather near Oroville, California	2,330	125	April-July	1,198
Yuba at Smartville, California	1,240	115	April-July	760
American, Inflow to Folsom Res., Calif.	1,500	114	April-July	916
Cosumnes at Michigan Bar, California	240	165	April-July	65
Mokelumne, Inflow to Pardee Res., Calif.	550	118	April-July	316
Stanislaus, Inflow to Melones Res., Calif.	860	120	April-July	456
Tuolumne, Inflow to Don Pedro Res., Calif.	1,430	125	April-July	722
Merced, Inflow to Exchequer Res., Calif.	750	123	April-July	371
San Joaquin, Inflow to Millerton Lake, Calif.	1,540	129	April-July	701
Kings, Inflow to Pine Flat Res., California	1,610	139	April-July	537
Kaweah, Inflow to Terminus Res., California	400	148	April-July	93
Tule, Inflow to Success Res., California	90	152	April-July	7
Kern, Inflow to Isabella Res., California	650	155	April-July	118
ALASKA				
Chena at Fairbanks, Alaska	560	126	May-June	524
Salcha near Salchaket, Alaska	640	110	May-June	699

Forecasts in California provided by Department of Water Resources.
Average is for 1953-67 period except California. California is computed for 1921-70 period.
Forecasts assume average Effective Climate Conditions from Date Through Snow Melt Season.

Explanatory Notes on Forecasts listed on Inside Back Cover.

RESERVOIR STORAGE as of MARCH 1, 1973



irrigation reservoirs is well above average.

In the lower Colorado Basin the Virgin River near Virgin, Utah is forecast at 184 percent. The current water supply outlook is excellent for all of Arizona. Reservoir storage is exceptionally good in all major reservoirs. Salt River Project reservoirs are 60 percent above average, while San Carlos contains $4\frac{1}{2}$ times its usual amount.

Snow cover varies from 167 percent on the Little Colorado to 295 percent on the Verde watershed. It is 189 percent on the Gila River and 207 percent on the Salt.

Salt River Project streams are predicted to produce 558,000 acre-feet during the March-May period. This is 69 percent above the average amount. The Gila River will yield twice its average amount. The Little Colorado River will produce a comparable amount.

GREAT BASIN

Most watersheds of the Great Basin have snowpacks which are near or well above average. Combined with excellent reservoir storage, this foreshadows good to excellent water supplies next summer for all areas except for some smaller watersheds in Oregon.

This year's snowpack ranges from a low of 75 percent average in Oregon's Lake County and 81 percent average on Utah's Logan River to highs of near 140 to 155 on the Ogden and Sevier rivers in Utah. In Nevada the snow is near 125 to 130 percent.

Lowest forecast in the Basin is for Oregon's Chewaucan near Paisley at 66 percent. Silvies near Burns is comparable at 70 percent. Streams where about 5 to 10 percent less than normal runoff is expected include Wyoming's Smith and Thomas Forks, Oregon's Deep Creek near Adel and the Donner and Blitzen near Frenchglen. Flow of all other streams in the Basin is anticipated to be normal or considerably more.

In Nevada water users on the Humboldt River can now anticipate the flow at Palisade to be near 128 percent of average. On the lower Humboldt, storage in Rye Patch Reservoir is 214 percent of the usual amount. This virtually assures excellent water supplies next summer for those served by this system.

Flow of the Sierra-Nevada streams into Nevada should be near 5 to 15 percent above average. Snow is above average in eastern Nevada. It is over twice normal on the Reese River in central Nevada, and is among the heaviest years of record in the south. Reservoir storage in Nevada is 143 percent of the normal amount.

In Utah stream forecasts range from 105 percent for Big Cottonwood Creek near Salt Lake to over twice normal on the East Fork Sevier in the south. Inflow to Pineview Reservoir on the Ogden River is forecast at 150 percent, while flow of the Sevier at Hatch and Gunnison is expected to be 165 percent. Most central and southern Utah streams are forecast at near 120 to 150 percent of normal.

At a third more than average, Utah's reser-

STORAGE IN LARGE RESERVOIRS

MARCH 1, 1973

BASIN AND NAME OF RESERVOIR	CAPACITY (1,000 A.F.)	STORAGE (1,000 A.F.)	STORAGE PERCENT AVERAGE	BASIN AND NAME OF RESERVOIR	CAPACITY (1,000 A.F.)	STORAGE (1,000 A.F.)	STORAGE PERCENT AVERAGE
UPPER MISSOURI				UPPER COLUMBIA			
Belle Fourche	185	156	190	Chelan	676	141	58
Boysen	550	254	65	Coeur d'Alene	225	53	39
Buffalo Bill	373	200	143	Duncan	1,347	137	---
Canyon Ferry	2,043	1,419	91	Flathead	1,791	1,010	105
Fort Peck	19,410	16,550	152	Hungry Horse	3,428	2,062	91
Garrison	24,790	20,075	194	Kootenay	673	453	105
Hebgen	377	254	149	Lake Koocanusa		270	---
Keyhole	192	158	451	Lower Arrow	3,083	391	99
Lake Francis Case	5,816	3,943	117	Noxon Rapids	335	321	109
Lake Sharp	1,900	1,738	105	Pend Oreille	1,155	393	77
Oahe	23,630	17,920	155	Roosevelt	5,232	3,729	125
Tiber	1,347	419	67	Upper Arrow	4,061	298	35
Big Horn	1,356	886	151				
PLATTE				LOWER COLUMBIA			
City of Denver (5)	507	392	101	Cougar	155	26	---
Colo-Big Thompson (3)	718	609	153	Detroit	300	56	59
Glendo	784	395	126	Green Peter	270	63	---
Pathfinder	1,016	919	241	Hills Creek	200	45	71
Seminole	1,010	513	161	Lookout Point	337	31	26
				Prineville	153	112	115
ARKANSAS				Wickiup	200	187	105
Conchas	273	143	88	Yakima Res. (5)	1,066	778	115
John Martin	354	17	20				
RIO GRANDE				SNAKE			
Elephant Butte	2,195	382	103	American Falls	1,700	1,091	76
El Vado	195	23	575	Anderson Ranch	423	290	136
				Arrowrock	287	278	110
UPPER COLORADO				Brownlee	980	475	114
Blue Mesa	830	315	88	Cascade	653	351	128
Flaming Gorge	3,749	2,875	230	Jackson	847	636	144
Navajo	1,696	888	165	Lucky Peak	278	178	167
Powell	25,002	12,217	238	Owyhee	715	603	146
Starvation	152	129	---	Palisades	1,200	933	131
				Warm Springs	191	111	118
LOWER COLORADO				PACIFIC COASTAL			
Havasu	619	535	100	Clair Engle	2,448	2,130	101
Mead	26,159	19,453	119	Clear Lake	440	310	136
Mohave	1,810	1,748	103	Nacimiento	350	267	141
Salt River Res. (4)	1,755	1,426	148	Ross	1,203	870	102
San Carlos	949	510	459	Upper Klamath	584	444	105
Verde River Res. (2)	318	304	258				
GREAT BASIN				CALIFORNIA CENTRAL VALLEY			
Bear	1,421	1,090	125	Almanor	1,036	680	101
Lahontan	314	245	128	Berryessa	1,602	1,595	102
Rye Patch	179	158	214	Bullards Bar	930	531	113
Sevier Bridge	236	129	160	Folsom	1,010	606	101
Strawberry	274	182	152	Isabella	570	77	41
Tahoe	732	544	132	McClure	1,026	454	82
Utah	884	786	141	Millerton	521	422	118
Willard Bay	293	162	---	Oroville	3,484	2,876	114
				Pine Flat	1,013	485	83
				Shasta	4,500	3,494	103

Reservoir Storage Data Provided by Bureau of Reclamation, Corps of Engineers, Geological Survey, and water using organizations. Data from California and British Columbia provided by Department of Water Resources and Department of Lands, Forests and Water Resources, respectively.

voir storage is excellent.

Outlook for California's Owens Valley is very good, with the Owens River expected to flow at 20 percent over the normal amount.

COLUMBIA BASIN

Snow accumulation during February was well below normal throughout most of the Columbia Basin, thus intensifying the effects of an already low snow cover. The mild temperatures of the month removed much of the lower elevation snows.

The snowpack now ranges between one-half to three-fourths of usual amounts on most of the major water producing areas. In British Columbia the snow is 83 percent of average on the upper Columbia, but drops to about 60 to 80 percent on the lower Columbia, Kootenay, Kettle, Okanagan and Similkameen rivers.

South of the international boundary the snowpack continues in the 60 to 80 percent range across northern Washington, western Montana, Idaho's Priest, Clearwater, Salmon, Boise, Big and Little Lost, and Big Wood rivers. Included in this same snow cover range are Oregon's Deschutes-Crooked, John Day, Grande Ronde, Burnt and Powder rivers, and Wyoming's upper Snake River.

At 15 percent normal, snow has practically disappeared from the Palouse River. Only 40 to 60 percent normal snow lies on Idaho's Spokane River, all Cascade Mountain watersheds in Washington and Oregon except the Chelan, Methow and Okanagan rivers. The Umatilla, Walla Walla and lower John Day are also included in the low snow zone.

The only watersheds having a normal to 10 percent above normal snow are the smaller southern Idaho tributaries to the Snake River.

Expected flow of the Columbia at The Dalles is now expected to be about three-fourths of its normal amount.

Streamflow prospects closely follow the snowpack distribution and range from about one-half average on streams such as the Spokane and Grande Ronde rivers, to two-thirds to three-fourths of average on most other streams.

Unless spring and summer months are wet, smaller irrigated areas having inadequate reservoir storage facilities and those dependent on direct diversion from streams can expect water shortages next summer.

Storage in irrigation reservoirs continues excellent, reflecting the remarkably high carryover from last year's heavy runoff.

ALASKA

Snowfall on Alaska's mountain watersheds was highly variable during February. Greater than normal snows fell on the Chena River, while the Matanuska and Susitna rivers recorded below average amounts for the month.

Watersheds in southeast Alaska have accumulated a heavy snowpack. On the Long River watershed it is 25 percent above average. It is also above normal on the upper Yukon. Snow is about 15 percent above normal and 25 percent above last year on the south slope of the Brooks Range. This includes the watersheds of the Koyukuk and Chandalar rivers.

In the Ketchikan area the snow surveys near Harriet Hunt Lake show a moderately heavy snowpack.

CALIFORNIA

The California Department of Water Resources, coordinating agency for snow surveys and water supply forecasting in California, reports that excellent water supply potentials for 1973 exist in almost all areas of the State. Major hydrographic areas all experienced above average precipitation, snow accumulation, and runoff during February.

March snow surveys confirm that above normal water reserves are being held in the snowpack, especially at the higher elevations. Snow water content ranges from a low of 105 percent of average in the Pit River drainage area to a high of 210 percent in the high elevation portion of the Kaweah River watershed. In the Kern River Basin, where water supply conditions in the lower reaches continue somewhat below normal, the snow stored water is 145 percent of average at mid-elevation snow courses and 190 percent of average in the higher elevation snow zone.

Precipitation amounted to 135 percent of average over the State during February. Some stations in the North Coastal area and the Pit River Basin, and a small area around Bakerfield, recorded somewhat below average precipitation for the month but most Central Valley stations registered about one-and-one-half times the monthly average. Coastal areas received up to twice average amounts and at Ophids, in the South Coastal area, a total of 25.8 inches, or 340 percent of average was recorded.

February runoff was above average on all streams in the Central Valley except for the Kern River. In the San Joaquin Valley portion, runoff ranged from 95 percent of average on the Kern River to 155 percent for the Merced. Sacramento Valley streams ranged from 105 percent of average on the Pit River to 165 percent on the Cosumnes. Below normal runoff was ex-

perienced in the Lahontan area and on several North Coastal area streams during the month.

In the Central Valley runoff for the water year to date generally follows the February pattern with only the Kern River below average for the five-month period. Runoff in several streams on the North Coast, and in the Lahontan area, has also been slightly below normal for the period.

Reservoir storage is up slightly from one year ago. In the Sacramento Valley reservoir storage is normal in all the larger reservoirs. The Department's Oroville Reservoir on the Feather River will fill this year and the U. S. Bureau of Reclamation reports that Folsom and Clair Engle Lakes should also fill. Storage in San Joaquin Valley reservoirs is still lagging below average for this date by about 10 percent. However, the excellent snowpack in headwater areas has resulted in

forecasts of inflows that will be well above average during the spring and summer snowmelt period. Millerton Lake is expected to fill and the U. S. Bureau of Reclamation reports that all contractual water and power deliveries will be met in the Central Valley Project Area. Millerton Lake will produce a full Class I water supply, and 80 percent of a full Class 2 water supply will be available this year. State Water Project commitments for water and power will also be met in all service areas.

Forecasts show that water year supplies will be 120 percent of average. Values range from a low of 90 percent of average for the South Coastal area to 160 percent in the San Francisco Bay Area. Most Central Valley streams are forecasted to produce from average to 120 percent of average flows during the 1972-73 water year.



EXPLANATION of STREAMFLOW FORECASTS

All flows are observed flows except as adjusted for: 1/ Storage change in Lake Sherburne. 2/ Storage change in Lima and Clark Canyon reservoirs. 3/ Storage change in Hebgen Lake. 4/ Storage change in Gibson Reservoir and measured diversions. 5/ Storage change in Two Medicine, Four Horns, Lake Francis and Swift reservoirs. 6/ Storage change in Canyon Ferry and Tiber reservoirs. 7/ Changes as indicated in (6/), (8/), plus storage change in Fort Peck. 8/ Storage change in Boysen, Buffalo Bill and Yellowtail reservoirs. 9/ Storage change in Buffalo Bill Reservoir plus Heart Mountain diversion. 10/ Storage change in Pilot Butte and Bull Lake reservoirs plus Wyoming canal diversion.

11/ Changes indicated in (10/) plus storage change in Boysen Reservoir. 12/ Plus diversions to Cache LaPoudre. 13/ Plus by-pass to power plants. 14/ Minus diversion thru Gumlick Tunnel. 15/ Storage change in Price Reservoir. 16/ Minus diversions from North Platte, Laramie and Colorado rivers plus measured diversions above station. 17/ Storage change in Clear Creek, Twin Lakes and Turquoise reservoirs minus diversions from Colorado River. 18/ Storage change in Rio Grande, Santa Maria and Continental reservoirs. 19/ Storage change in El Vado and Abiquiu reservoirs. 20/ Storage change in Platoro Reservoir.

21/ Storage change in Grandby Reservoir as furnished by U.S.B.R. plus diversions by Adams Tunnel and Grand River Ditch. 22/ Changes as indicated in (21/) plus diversions thru Roberts, Gumlick and Moffat tunnels and storage change in Dillon, Homestake, Williams Fork, Green Mountain and Willow Creek reservoirs. 23/ Changes indicated in (22/) and (26/). 24/ Storage change in Blue Mesa Reservoir. 25/ Changes indicated in (24/), (30/) and (35/) and storage change in Lake Powell. 26/ Diversions to Arkansas River plus storage change in Ruedi Reservoir. 27/ (Inflow record as computed by U. S. Bureau of Reclamation.) 28/ Storage change in Taylor, Blue Mesa and Morrow Point reservoirs. 29/ Storage change in Fontenelle Reservoir. 30/ Storage change in Flaming Gorge Reservoir.

31/ Plus diversion through Duchesne Tunnel. 32/ Storage change in Moon Lake Reservoir. 33/ Storage change in Scofield Reservoir. 34/ Storage change in Joe's Valley Reservoir. 35/ Storage change in Navajo Reservoir. 36/ Plus U. P. & L. Co. tailrace and Logan, Hyde Park and Smithfield canals. 37/ Minus diversions thru Duchesne Tunnel and Weber-Provo Canal. 38/ Storage change in Lake Tahoe and Boca reservoirs (Forecast by Truckee Basin Committee.) 39/ Storage change in Bridgeport Reservoir. 40/ Corrected for major upstream impairments -- represents simulated natural flow conditions.

41/ Storage change in Priest Lake. 42/ Storage change in Coeur d'Alene Lake and diversions by Spokane Valley Farms Co. and Rathrum Prairie canals. 43/ Storage change in Lake Chelan. 44/ Storage change in Jackson Lake. 45/ Storage change in Jackson Lake and Palisade reservoirs. 46/ Storage change in Jackson Lake, Palisades, Island Park, Henry's Lake, Grassy Lake plus diversions between Heise and Blackfoot. 47/ Storage change in Henry's Lake and Island Park reservoirs. 48/ Storage change in MacKay Reservoir and diversion in Sharp Ditch. 49/ Combined flow Big Wood near Bellevue and Camas Creek near Blaine. 50/ Storage change in Arrowrock, Anderson Ranch and Lucky Peak reservoirs.

51/ Storage change in Wild Horse Reservoir. 52/ Storage change in Cascade and Deadwood reservoirs. 53/ Storage change in Keechelus, Kachess and CleElum reservoirs plus diversion by Kittitas Canal. 54/ Changes indicated in (52/) plus storage change in Bumping and Rimrock Lakes plus diversion by Roza, Union Gap, New Reservation, Old Reservation and Sunrise canals. 55/ Storage change in Bumping and Rimrock lakes and diversions by Tieton, Selah Valley, Wapatox canals and City of Yakima. 56/ Storage change in Merwin, Yale and Swift reservoirs. 57/ Storage change in Mayfield Reservoir.

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